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CONNECTICUT

AGRICULTURAL EXPERIMENT STATION

NEW HAVEN, CONN.

BULLETIN 142, JANUARY, 1903.

SPRAY CALENDAR.

This Bulletin is printed on a single sheet of card board, with a calendar attached. The size, shape and material make it impossible to bind with other bulletins and reports.

This sheet is designed to take its place in bound files of the publications of this Station.

1903 CALENDAR. 1903

JANUARY.

Sun.		4	11	18	25	
Mon.		5	12	19	26	
Tues.		6	13	20	27	
Wed.		7	14	21	28	
Thurs.	1	8	15	22	29	
Fri.	2	9	16	23	30	
Sat.	3	10	17	24	31	

FEBRUARY.

Sun.	1	8	15	22		
Mon.	2	9	16	23		
Tues.	3	10	17	24		
Wed.	4	11	18	25		
Thurs.	5	12	19	26		
Fri.	6	13	20	27		
Sat.	7	14	21	28		

MARCH.

Sun.	1	8	15	22	29	
Mon.	2	9	16	23	30	
Tues.	3	10	17	24	31	
Wed.	4	11	18	25		
Thurs.	5	12	19	26		
Fri.	6	13	20	27		
Sat.	7	14	21	28		

APRIL.

Sun.		5	12	19	26	
Mon.		6	13	20	27	
Tues.		7	14	21	28	
Wed.	1	8	15	22	29	
Thurs.	2	9	16	23	30	
Fri.	3	10	17	24		
Sat.	4	11	18	25		

MAY.

Sun.		3	10	17	24	31
Mon.		4	11	18	25	
Tues.		5	12	19	26	
Wed.		6	13	20	27	
Thurs.		7	14	21	28	
Fri.	1	8	15	22	29	
Sat.	2	9	16	23	30	

JUNE.

Sun.		7	14	21	28	
Mon.	1	8	15	22	29	
Tues.	2	9	16	23	30	
Wed.	3	10	17	24		
Thurs.	4	11	18	25		
Fri.	5	12	19	26		
Sat.	6	13	20	27		

JULY.

Sun.		5	12	19	26	
Mon.		6	13	20	27	
Tues.		7	14	21	28	
Wed.	1	8	15	22	29	
Thurs.	2	9	16	23	30	
Fri.	3	10	17	24	31	
Sat.	4	11	18	25		

AUGUST.

Sun.		2	9	16	23	30
Mon.		3	10	17	24	31
Tues.		4	11	18	25	
Wed.		5	12	19	26	
Thurs.		6	13	20	27	
Fri.		7	14	21	28	
Sat.	1	8	15	22	29	

SEPTEMBER.

Sun.		6	13	20	27	
Mon.		7	14	21	28	
Tues.	1	8	15	22	29	
Wed.	2	9	16	23	30	
Thurs.	3	10	17	24		
Fri.	4	11	18	25		
Sat.	5	12	19	26		

OCTOBER.

Sun.		4	11	18	25	
Mon.		5	12	19	26	
Tues.		6	13	20	27	
Wed.		7	14	21	28	
Thurs.	1	8	15	22	29	
Fri.	2	9	16	23	30	
Sat.	3	10	17	24	31	

NOVEMBER.

Sun.	1	8	15	22	29	
Mon.	2	9	16	23	30	
Tues.	3	10	17	24		
Wed.	4	11	18	25		
Thurs.	5	12	19	26		
Fri.	6	13	20	27		
Sat.	7	14	21	28		

DECEMBER.

Sun.		6	13	20	27	
Mon.		7	14	21	28	
Tues.	1	8	15	22	29	
Wed.	2	9	16	23	30	
Thurs.	3	10	17	24	31	
Fri.	4	11	18	25		
Sat.	5	12	19	26		

APPLE.

Insects.

Bud-Moth—Caterpillars feed upon unfolding leaves. Spray with Paris Green or Arsenate of Lead before buds open. Repeat a few days later.

Codling-Moth, Apple-Worm—Caterpillar tunnels inside the fruit, especially around the core.

Curculio—Grub tunnels inside the fruit, making it gnarled and ill-shaped.

Canker-Worm—Feeds upon the leaves and spins down on threads when disturbed.

Tent-Caterpillar—Forms nests on the branches in May and devours the leaves.

Spray as soon as blossoms fall with Paris Green or Arsenate of Lead in Bordeaux Mixture, keeping the foliage well covered with the mixture until fruit is nearly grown.

Destroy egg-masses of tent-caterpillar in winter, and remove nests with caterpillar brush.

Place sticky bands around trunks of trees to trap canker-worm in fall and spring.

Maggot, Railroad-Worm—Tunnels through pulp of fruit. Destroy all infested fruit.

San Jose′ Scale—See Pear.

Scurfy Bark-Louse
Oyster-Shell Bark-Louse
} Scale-insects on bark which suck the sap from the twigs. Spray with Soap and Water or Kerosene Emulsion about the second week in June.

Flat-Headed Borer
Round-Headed Borer
} Burrow in the base of the trunk. Watch trees and dig out borers wherever castings appear.

Bitter Rot—Forming depressed rotten areas on the fruit and cankers on the branches. Spray with Copper Sulphate or Bordeaux before the buds swell. As soon as rot appears on fruit search trees for cankered branches above the infected fruit and cut them out. Where severe, spray repeatedly with Bordeaux and Amm. Sol. Cop. Carbonate during the season. In Connecticut, treatment may, perhaps, be limited to the winter spraying and to the removal of mummied and rotten fruit and cankered branches.

Black Rot—Causing mature fruit to rot, eventually turning it black; often forming small brown spots on leaves; doing most serious damage through cankers on branches, which are eventually killed. Treatment by spraying not yet satisfactorily determined but a winter spraying advisable, and the pruning and destruction of all dead limbs and twigs.

Rust—Showing as orange-colored blotches on leaves, eventually producing minute fringed clustered cups imbedded on the under side; very rarely on fruit or twigs. Rust spreads to the apple from the *cedar apples*, which appear in the early spring on the red cedar. All cedars near the orchard should be destroyed. There is great difference in the susceptibility of different varieties to this disease. Spraying is of doubtful value.

Scab—Producing "scabby spots" on fruit and leaves; rarely on twigs. Spray, with Bordeaux, the unfolding leaves before the blossoms open, again after the petals fall, and, if season is wet, follow with a third spraying about ten days later. Sometimes a winter treatment with Copper Sulphate is given before the buds swell.

Sooty Blotch—Forming on fruit an olive-black superficial growth in distinct round colonies, or often merging together. Spray with Bordeaux after petals drop, again in 10 to 14 days, and a third time in about two weeks. If necessary, follow this with a fourth treatment. The first treatment corresponds with the second for scab. Selby, of Ohio, claims that one spraying, when the apples are about the size of hickory nuts, may largely prevent this trouble.

GENERAL TREATMENT OF APPLE ORCHARDS.

As a rule, apple orchards are well protected from our common fungus and insect pests by three sprayings yearly:

1. Spray with Copper Sulphate Solution just before buds start, for Bitter Rot, Black Rot and Scab. This treatment is often omitted.

2. Spray unfolding leaves with Paris Green or Lead Arsenate in Bordeaux for Bud Moth and Apple Scab.

3. Spray with same as soon as blossoms fall for Codling Moth, Curculio, Canker Worm, Tent Caterpillar, Scab and Sooty Blotch.

If badly infected with Scab or Sooty Blotch, spray with Bordeaux Mixture ten days later, and for Sooty Blotch follow with further spraying.

San José Scale, Bark Lice and Borers need other treatment. See above.

ASPARAGUS.

Insects.

Asparagus Beetle—Adults and larvæ devour the foliage. Spray with Hellebore.

Fungi.

Rust—Producing most conspicuous stage as short reddish or black pustules scattered over stems. In fall carefully gather and burn all stems from affected beds and escaped plants in vicinity. Spraying with Resin Bordeaux partially controls the disease but this is a difficult and expensive operation. Begin spraying the latter part of July and repeat about every 10 days until the middle of September.

BEAN.

Fungi.

Anthracnose—Showing on leaves and pods as roundish discolored areas, often with a purplish border. Select only sound seed for planting and destroy all infected seedlings. Where very troublesome spray with Bordeaux, beginning when plants are only a few inches high and repeating about every 10 to 14 days until pods are forming. Rotation and destruction of old vines may prove helpful in keeping the trouble in check.

Blight—Appearing much like anthracnose but with discolored areas usually having more of a translucent or watery character. Treat the same as anthracnose.

Downy Mildew—Forming dense white woolly growths on pods and less luxuriantly on young stems and leaves of the Lima bean. As the fungus usually appears first and most vigorously in low, moist places, the land used should be high or well drained. Spraying, beginning with Bordeaux and ending with Amm. Sol. Cop. Carbonate and repeated every 10 to 14 days from the last of June until the first part of September, is helpful in keeping this trouble in check.

Rust—Producing small round reddish or black dusty outbreaks usually on the leaves. Plant varieties not likely to rust. Burn the old infected plants in the fall.

BLACKBERRY.

Insects.

Cane-Borer—See Raspberry.

Fungi.

Crown Gall—See Raspberry.

Leaf Spot—Forming on leaves small circular spots with a whitish center and purplish border; also occurring on dewberry and raspberry. This is usually not so serious as to demand attention but where necessary it probably can be controlled by Bordeaux applied to the leaves, beginning before they have reached their full size.

Orange Rust—Breaking out as bright orange dusty masses of spores over the under side of the leaves in spring or early summer. The fungus is perennial in the underground parts of the host so that the disease appears year after year. As soon as an infected plant is found dig it up and burn.

CABBAGE—CAULIFLOWER.

Insects.

Cabbage-Worm—Devours the leaves. Spray young plants with Paris Green. Use Pyrethrum on headed plants.

Aphis or Louse—Sucks sap from the tissues. Spray with Soap or Kerosene Emulsion.

Fungi.

Club Root—Causing knob-like enlargements on the roots of cabbage and allied plants. The disease germs often become established in the soil; when possible, avoid such land and the use of refuse from old plants on the soil. Infected land, when used, should be treated in the fall with lime broadcast at rate of 80 bushels per acre and then worked in, and it should be planted only with cabbage grown in uninfected soil.

CARNATION.

Fungi.

Rust—Producing small dusty pustules, more or less confluent, on the leaves and stems. Select, if feasible, only rust-resisting varieties. Spray in field with Bordeaux, having 1½ lbs. soap added to each 50 gallons (helps mixture to adhere to plants). Select for transplanting only hardy and if possible rust-free specimens. Keep air of greenhouse as dry as is consistent with good growth.

Leaf Mold and Leaf Spot—Two troubles much alike in appearance, producing greyish spots with colored borders, on stem, leaves and calyx. Treat as for rust.

CELERY.

Insects.

Celery Caterpillar—Feeds upon the leaves of celery, parsley, carrot and parsnip. On the two latter plants Paris Green may be used. On celery, hand-picking is perhaps the best remedy.

Fungi.

Leaf Blight and Leaf Spot—Two diseases producing "rusty" spots on leaves and petioles, the latter trouble distinguished by the very minute black dots in the discolored spots. Begin spraying soon after transplanting. Bordeaux and Amm. Sol. Cop. Carbonate are efficient, especially the latter, which is often used for the later sprayings. Spray every 10 to 14 days until celery is banked. Sturgis found that dusting sulphur over the plants was also an effective treatment. Any treatment to prove efficient must be started early and be done thoroughly.

CHERRY.

Insects.

Cherry Slug—Eats away the green portion from the leaf. Spray with Hellebore.

Plum Curculio—See Plum.

Aphis or Louse—See Peach.

Fungi.

Black Knot—Forming knot-like excrescences on the twigs and trunks. Prune off and burn all infected branches, painting over large cut surfaces. Winter spraying with Copper Sulphate and later spraying with Bordeaux proved of benefit in one experiment.

Leaf Spot—Causing numerous closely-placed purplish spots on leaves, which often have "shotholes." Spraying, if begun early in May, is effective in preventing this disease, but it may be necessary to use the diluted Bordeaux to avoid injury to the foliage. Give several sprayings at intervals of two weeks.

Powdery Mildew—Making a cobweb-like growth over the leaves, and in fall also forming numerous minute black bodies, especially on under surfaces. This disease is worst on young trees, especially in the nurseries, but is controlled by spraying with Bordeaux or Potassium Sulphide.

CORN.

Insects.

Corn Worm—Eats the immature kernels from the ear. Hand-picking is the best remedy.

Fungi.

Smut—Causing the black dusty outbreaks that appear on various parts of the host. It is especially injurious to certain varieties of sweet corn. Use varieties most exempt from attack and avoid the use of *fresh* manure on such land, as the smut propagates aerial spores in this. Seed treatment is ineffective.

CUCUMBER.

Insects.

Striped Beetle—Attacks young plants, eating the leaves. Apply Paris Green or Arsenate of Lead. Cover plants with screens.

Aphis or Louse—See Melon.

Fungi.

Anthracnose—Producing, more or less merged, discolored spots on leaves; also occurring on fruit. Treatment the same as for the mildew, except first spraying is given as soon as vines commence to run.

Downy Mildew—Causing discolored spots as with preceding but beneath showing a minute thin growth of upright threads bearing dark colored spores. Repeated sprayings with Bordeaux about every 10 days during season, beginning at least by middle of July, is useful in keeping this disease in check. The same fungus also occurs on melon.

CURRANT.

Insects.

Currant-Worm—Devours foliage. Apply Hellebore early in season.

San Jose' Scale—See Pear.

Scurfy Bark-Louse—See Apple.

Fungi.

Anthracnose and Leaf Spots—Causing spots on the leaves and usually their premature shedding. Give first spraying with Bordeaux before leaves appear, the second as the leaves are unfolding and repeat at intervals of 10 to 14 days until fruit begins to turn.

ELM.

Insects.

Elm Leaf-Beetle—Adults eat holes through the leaves in May, and later the larvæ eat away the green part from the under side of the leaves. Spray with Arsenate of Lead early in May to kill egg-laying beetles, or spray the under side of the leaves with the same preparation about the first of June to destroy the larvæ. Pupæ at the base of the trees may be killed with Kerosene Emulsion, or soap and water.

GOOSEBERRY.

Insects.

Currant-Worm—See Currant.

Gooseberry Fruit-Worm—Feeds inside the berry. Destroy infested berries.

Fungi.

Mildew—Showing as a dense dirty white growth on fruit and leaves of young shoots. Spray with Potassium Sulphide as soon as buds break and repeat about every 10 days until end of June.

GRAPE.

Insects.

Flea-Beetle—Adults and larvæ often feed upon the leaves. Spray with Paris Green or Arsenate of Lead.

Leaf-Hopper—Sucks the sap from the under side of the leaf. Spray the under surface of the leaf with Kerosene Emulsion.

Berry-Worm—Feeds and develops inside the berries. Destroy infested berries before the insects escape.

Sphinx Caterpillars—Several species feed upon the leaves. Spray with Paris Green or practice hand-picking.

Fungi.

Black Rot—Forming reddish brown spots on leaves; more rarely on stems; especially rotting the berries, which finally become hard, shrunken and wrinkled black mummies. This is one of the worst diseases of the grape and often difficult to control by spraying, which must be thorough, especially the first season, and be continued at least the second season with almost as much care. Begin spraying before blossoming, about the last of May, with second application just after blossoming and subsequent sprayings at intervals of about 7 to 10 days. Use Bordeaux up to the middle of July and then change to Amm. Sol. Cop. Carbonate, which should be used until the middle of August. This treatment requires about 3 to 4 sprayings with the former and 2 to 3

with the latter fungicide, according to the season and the severity of attack.

Downy Mildew—Developing usually dense white patches of fungous threads on under side of leaves and causing more or less discoloration on the upper; also occurring on stems and fruit. Treat the same as for black rot, except later sprayings are at longer intervals.

Powdery Mildew—Producing a cobweb-like growth over upper surface of leaves; most conspicuous in the fall when the small round yellowish to black fruiting bodies are found scattered over surface. Treat as for downy mildew with perhaps a late spraying in the fall, after gathering berries, to destroy the winter spores. Potassium Sulphide is also used effectively against this fungus.

LETTUCE.

Insects.

Aphis or Green-Fly—Sucks the sap from the tissues. Fumigate with Tobacco or Hydrocyanic Acid Gas. Spray with Soap and Water.

Fungi.

Leaf Mold and Mildew—The first producing a brownish and the second a white moldy growth on the leaves. These diseases are kept in check by sub-irrigation or care in watering and ventilating to keep plants and atmosphere as free from moisture as is consistent with good growth.

Drop—Causing sudden wilting of plants by rotting off leaves at surface of soil, often showing a white moldy growth over the basal parts. This may develop into a serious trouble in the greenhouse, as the fungus often becomes established in the soil, when the best remedy is to change the soil entirely or sterilize it by steam or hot water.

MAPLE.

Insects.

Borer—Makes large tunnels in the trunk, often girdling the

trees. Examine trees for castings in September. Inject Carbon Bisulphide into the burrow and stop it up tight.

MELON.

Insects.

Striped Cucumber Beetle—See Cucumber.

Squash Borer—See Squash.

Aphis or Louse—Sucks the sap from the under side of the leaves. Place tobacco stems around young plants. Spray under side of leaves with Soap or Kerosene Emulsion.

Fungi.

Leaf Mold—Producing dead spots on the leaves very similar to those caused by the downy mildew. Spray with Bordeaux on the first running vines and repeat every 7 to 14 days, making 3 to 5 applications according to season.

Downy Mildew—Forming angular brown, eventually dead, spots in the leaves, often stunting or killing vines; most prominent just before vines come into bearing; fruit not maturing or worthless because lacking flavor. During 1902 this was the chief cause of melon failure in this State. It is somewhat questionable whether it can be controlled effectively and profitably by spraying during such a moist season. The spraying should be started soon after the vines begin to run, at least during first part of July, and the vines should be kept covered with Bordeaux, especially from middle of July to middle of August.

OATS.

Fungi.

Smut—Destroying the grain by a black dusty mass of spores. Seed treatment is effective in preventing this smut. Either soak the seed 8 to 10 minutes in hot water at 132–5° F., or sprinkle with Formalin as per directions.

ONION.

Insects.

Maggot—Infests the bulb of the young plant. Practice rotation of crops.

Fungi.

Anthracnose (Black Spot)—Producing black circular spots on the bulbs, usually appearing on white varieties after storing in the barns. Store onions as dry as possible and keep barns dry and cool. Avoid piling onions too deeply in the bins. Possibly Air-Slaked Lime scattered over them at time of storing may prove beneficial.

Smut—Forming black dusty outbreaks on various parts of plants raised from seed, especially injurious to the seedlings. This fungus becomes established in the soil, hence infected land should be avoided or used only for transplanted onions. If, however, it is seeded, apply in the drills per acre 100 lbs. of Sulphur thoroughly mixed with 50 lbs. of Air-Slaked Lime. Formalin (1 lb. to 30 gals. water) thoroughly sprinkled over the seed before covered with the soil, or applied by drip attachment to the seeder is an efficient remedy. Ground lime drilled in the land with a fertilizer drill at rate 75 to 125 bushels per acre is helpful in keeping the trouble in check.

Stem Rot—Rotting bulbs at stem end where they become soft and shrunken, sometimes showing beneath the layers a dense olive-brown growth of mold. This fungus in a moist season occurs on various parts of the plant in the field, but does not seem to cause serious trouble with the bulbs until sometime after they have been placed in the barns. Treat same as for black spot. Probably this is a trouble that will prove serious only in very damp seasons.

PEA.

Insects.

Green-Pea Louse—Sucks the sap from the leaves and stems. Spray vines with Soap and Water. Brush the vines and cultivate. Practice early planting.

PEACH.

Insects.

Aphis or Louse—Sucks the sap from the leaves. Spray with Soap or Kerosene Emulsion.

Borer—Tunnels in the base of the trunk. Dig out in late fall and early spring.

Fruit Bark-Beetle or Shot-Hole Borer—Makes minute tunnels under the bark of branches and trunk. Burn infested trees and keep others thrifty.

Curculio—See Plum.

San Jose' Scale—See Pear.

Fungi.

Crown Gall—See Plum.

Leaf Curl—Causing leaves, early in spring, to become irregularly curled and swollen and often covered with a whitish bloom. In April, as soon as buds first begin to swell, spray the trees thoroughly with Bordeaux. In very wet seasons a second application with *dilute* Bordeaux may be given just after the petals fall.

Scab—Producing roundish dark brown spots on the fruit, "shot-holes" in the foliage and discolored areas on the young twigs. Give both sprayings as for leaf curl and these should be followed with one or two treatments with Potassium Sulphide upon the half-grown fruit.

Brown Rot—Occurring on the young twigs, etc., but causing most serious injury to the fruit, rotting it about the time of its maturity. The rotten areas usually become covered with numerous pustules of dusty brownish spores; eventually the diseased fruits form hard mummies. Give both sprayings as for leaf curl, another with dilute Bordeaux after fruit sets, and two with Potassium Sulphide as fruit begins to ripen. During season pick and destroy all rotten fruit as often as possible and in the fall destroy *all* the mummies found on trees and ground. This same fungus occurs on plums and cherries and less commonly on pears and apples. Copper Acetate (6 ozs. to 50 gals. water) is used by some in place of Potassium Sulphide.

Yellows—Causing premature ripening and red spotting of fruit and forming sickly yellowish growths from buds of trunks. This is a contagious but not a fungous disease. Root out and burn all trees as soon as found.

PEAR.

Insects.

Psylla—Sucks the sap from the twigs. Spray with Kerosene Emulsion, just after the leaves have expanded, to kill the young. If necessary repeat in midsummer just after heavy rains.

San Jose' Scale—Spray with Lime, Sulphur and Salt Mixture on dormant trees in winter; 25% Crude Oil and Water in early spring just before buds start; 15% Kerosene and Water to trees in foliage to prevent spreading through the summer.

Scurfy Bark-Louse—See Apple.

Fall Web-Worm—Forms nests on the branches in August and devours the foliage. Spray with Paris Green or Arsenate of Lead. Remove the nests while small.

Fungi.

Blight—Killing young twigs (especially in spring) and even large branches, when leaves suddenly turn black; also producing sunken dead areas on trunks. This is a bacterial disease chiefly spread by bees during blossoming period. Winter-prune all diseased branches, cutting off several inches *below* the diseased area. Several weeks after blossoming remove all young dead twigs in same way. Use knife that is sterilized from time to time by wiping with a cloth saturated with carbolic acid. This disease occurs also on apple and quince.

Leaf Blight—See Quince.

Leaf Spot—Forming on the leaves angular whitish spots usually with minute black dots in their center. Treat same as for pear scab.

Scab—Developing olive-black scabby spots on fruit and leaves, often causing the former to become distorted and cracked. The fungus is said to live over winter on twigs. Spray with Bordeaux on unfolding leaves before blossoms open, again after petals fall and give the third spraying about two weeks later.

PLUM.

Insects.

Curculio—Grub infests the growing fruit, causing it to fall. Jarring the trees each morning for six weeks after blooming, and catching the beetles on sheets is probably the best remedy. Spraying with Paris Green or Arsenate of Lead during the same period is also advised.

Fruit Bark-Beetle—See Peach.

Plum Scale—A large, brown scale on the twigs, sucking the sap. Spray with Soap or Kerosene Emulsion.

San Jose' Scale—See Pear.

Aphis or Louse—See Peach.

Fungi.

Black Knot—See Cherry.

Brown Rot—See Peach.

Crown Gall—Producing hard roundish knots one-half inch or more in diameter, usually near crown or on roots, less frequently on lower part of trunk. Discard affected trees for planting. Remove knots when found and paint over cut surface. This is said to be very troublesome in some states, but here, as yet, little damage has resulted from it. It also occurs on peach and the same or a similar thing on apples, blackberries and raspberries.

Plum Pocket, and Leaf Curl—Two closely related fungi causing young fruit to become irregularly inflated and producing distortion of young branches and leaves. These are troubles similar to peach curl and probably will yield to same treatment.

POTATO.

Insects.

Colorado Beetle—Adults and larvæ devour the leaves. Apply Paris Green or Arsenate of Lead. May be used in Bordeaux Mixture.

Flea Beetle—Adults eat the leaves. Use Bordeaux Mixture containing Paris Green.

Stalk-Weevil—Tunnels inside the stalk. Burn infested vines.

Fungi.

Blight or Downy Mildew—Causing a sudden blackening of the leaves, and often death of vines, during July and August; usually showing frost-like growth of fungus on the under side of leaves. Spray with Bordeaux before the trouble appears, about July 7 to 10, and keep vines well covered, especially from the middle of July to middle of August. Unless season is very moist three sprayings should suffice. If this treatment is impossible, plant early varieties only.

Scab—Producing the *scabby* appearance at surface of tubers. Soak seed tubers about two hours in Formalin and avoid planting on infected land. The use of barnyard manure will increase the amount of scab. The same trouble occurs on beets and turnips.

QUINCE.

Insects.

Borer—See Apple.

Curculio—Grubs infest growing fruit, causing it to be knotty. Jar the trees same as for plum curculio.

Fungi.

Black Rot—Rotting the fruit, often beginning at the blossom end; also killing twigs and branches. In the fall or spring cut off and burn all dead branches. Before buds swell spray with Bordeaux. Experiments have not demonstrated just what should be the subsequent treatment, but probably a second spraying with Bordeaux should follow soon after petals fall and one or two sprayings with Amm. Sol. Cop. Carbonate about time fruit begins to assume full size.

Blight—See Pear.

Leaf Blight—Forming rounded, often confluent, reddish brown spots with central black dots on leaves and fruit, the former often shedding prematurely and the latter cracking irregularly. Spray with Bordeaux just before blossoms open, again soon after they fall, and follow with 1 to 3 additional treatments at intervals of 2 or 3 weeks, according to the weather. This fungus also occurs on pear.

Rusts—Producing small clustered cups, with fringed borders and filled with orange spores, on fruit and young twigs and leaves. Treat as for apple rust.

RASPBERRY.

Insects.

Cane-Borer—Cut and burn infested canes.

Fungi.

Anthracnose—Forming more or less confluent whitish spots with purplish borders on the stems. In spring, before buds swell, cut out and burn all badly infected canes and then spray with Bordeaux. If disease is very bad, spray again when young shoots are about six inches high and repeat in 10 to 14 days. Aim to cover chiefly the young shoots with the spray. After fruit is gathered, again remove any badly infected canes.

Cane-Blight—Causing superficial reddish discolorations, beginning at base of petioles and gradually spreading over canes; with more or less curled leaves having a sickly yellowish tint. This is a rather bad trouble with certain red varieties, but seems as yet to have had little attention paid to it. Treatment should probably be the same as for anthracnose.

Crown Gall—Forming galls or irregular excrescences on roots and lower parts of stems of both blackberries and raspberries. Dig out and burn affected plants as soon as discovered. Never use infected stock for transplanting.

Leaf Spot and Rust—See Blackberry.

ROSE.

Insects.

Aphis or Green Fly—Sucks sap from the leaves and stems. Spray with Soap or Kerosene Emulsion.

Leaf-Hopper—Sucks the sap from the under side of the leaves. Spray with Soap or Kerosene Emulsion.

Slug—Eats away the green portion of the leaves. Spray with Soap or Hellebore.

Fungi.

Leaf Blotch—Showing large purple-black blotches on leaflets, which often turn yellow and fall off. For greenhouse treatment paint hot water pipes with mixture of Sulphur and Oil. Potassium Sulphide or Amm. Sol. Cop. Carbonate can be sprayed on the foliage. Spraying out of doors can be done with Bordeaux, if there is no objection to the sediment on the leaves.

Mildew—Developing a white powdery or cobweb-like growth on the young leaves, which become more or less distorted and fall off. Treat same as for leaf blotch.

SQUASH—PUMPKIN.

Insects.

Squash Borer—Tunnels in the base of the stem, causing decay. Cover the joints of the vine with earth so that new roots may be formed to support the plant. Grow a few early plants for traps, and destroy them. The main crop should be planted rather late.

STRAWBERRY.

Insects.

Crown-Borer—Grub feeds in the crown of the plant. Practice crop rotation. Plant on new land. Burn over infested fields in fall.

Fungi.

Leaf Spot—Forming conspicuous discolored spots, usually with whitish centers and purplish borders. Frequently renew beds. After fruiting season cut off leaves with mower, add a little straw where necessary and burn over beds. Spraying with Bordeaux is efficient; one spraying before blossoming and two after fruiting season is over may be necessary.

TOMATO.

Insects.

Tomato Worm—A large caterpillar devouring the leaves. spray young plants with Paris Green or Arsenate of Lead. On fruiting plants handpicking is best remedy.

White-Fly—Occurs on the under side of leaves and here it sucks the sap. Spray under side of the leaves with Soap and Water.

Fungi.

Leaf Spot—Producing on leaves and stems numerous small dark spots, often with white centers. Begin spraying with Bordeaux about 2 or 3 weeks after transplanting, making 2 or 3 applications at intervals of about 3 weeks.

VIOLET.

Eel-Worms—Form galls on the roots. Plant in new soil or sterilize the old soil by steam. Add plenty of Air-Slaked Lime to the soil.

Fungi.

Leaf Blight—Causing whitish round spots on the leaves. Spray field plants early in the fall with Bordeaux. Select only best stock for greenhouse; remove *all* affected leaves before transplanting. When plants become established spray again with Bordeaux. Be careful about watering plants and by proper ventilation and heat during September to November, keep atmosphere of house from ever becoming too moist.

WHEAT.

Insects.

Hessian Fly—Maggots feed in the stalk. Seed a few strips of land early and destroy the crop after eggs have been deposited.

Bulb-Worm—Infests the crown of the plant.

Chinch Bug—Sucks the sap from the leaves. Spray with Kerosene Emulsion or Soap and Water. Burn over all infested land in fall, winter or spring to kill hibernating bugs.

Apply to foliage for Elm Leaf-Beetle and all biting insects. May be added to Bordeaux Mixture.

HELLEBORE.

May be dusted on the plants, or mixed with water 1 oz. in 2 gals. For Currant-Worm and Asparagus-Beetle.

COMMON SOAP.

1 lb. in 8 gals. Water.

Spray upon foliage to kill Red Spider, Plant-Lice and other sucking insects.

KEROSENE EMULSION.

2 gals. Kerosene.
½ lb. Common Soap.
1 gal. Water.

Dissolve the soap in hot water, add the kerosene, and churn all together until a white creamy mass is formed which thickens on cooling. Dilute nine times before using.

Hydrocyanic Acid Gas.

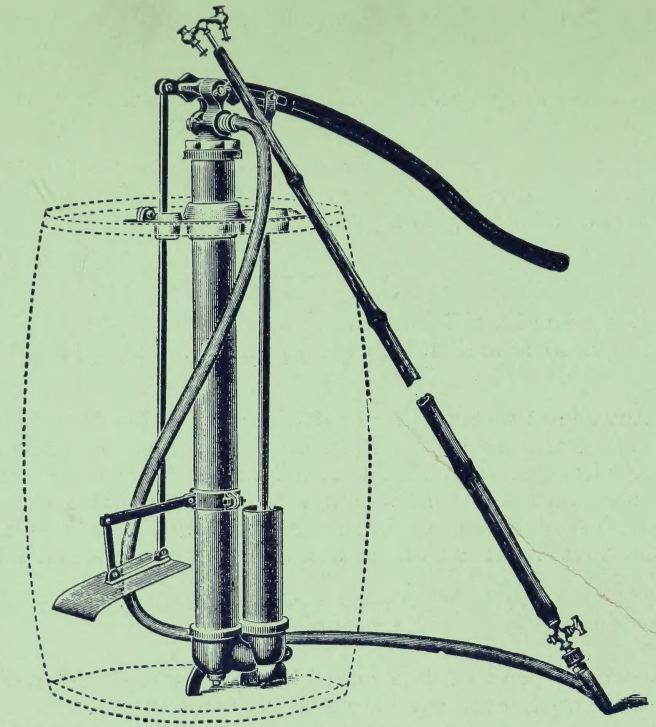
1 oz. Cyanide of Potash,
2 ozs. Sulphuric Acid. 4 ozs. Water.

For each 100 cu. ft. space.

Place the acid and water in an earthen jar in the house, and when all is ready, drop in the cyanide, close the house and keep away from it for half an hour. Then ventilate for ten minutes before going inside. This is for dormant trees. In greenhouse use 1 oz. of cyanide for each 1000 cu. ft. of space.

CARBON BISULPHIDE.

Used to kill insects infesting stored grain, in tight bins. Use 1 lb. for 100 bushels of grain.



BEST TYPE OF SPRAY OUTFIT.

5 gals. Water.

Dissolve resin in kettle of oil heated over fire; cool slightly; add lye, slowly stirring; then add water and boil until mixture will dissolve thoroughly in cold water. Use 2 gals. of this to 48 gals. of Bordeaux. This mixture is useful where ordinary Bordeaux will not readily adhere to the plants.

Amm. Sol. Cop. Carbonate.

5 ozs. Copper Carbonate.
3 pts. Ammonia.
50 gals. Water.

Use *just enough* ammonia (if strong, diluted with several volumes of water) to dissolve the copper carbonate; then dilute to final volume. This fungicide is not as good as Bordeaux, but is used where no sediment is desired on the foliage or fruit.

COPPER SULPHATE.

3 to 4 lbs. Copper Sulphate.
50 gals. Water.

This strength can be used only as a winter spray; sometimes a weaker solution, 1 lb. to 250 gals. water, is used on the foliage.

POTASSIUM SULPHIDE.

3 ozs. Potassium Sulphide.
10 gals. Water.

This is used chiefly to prevent the mildews.

FORMALIN.

A { **1 lb. (1 pt.) Formalin.** **50 gals. Water.** } **Grain Smut.**

B { **1 lb. (1 pt.) Formalin.** **30 gals. Water.** } **Potato Scab.**

A. Thoroughly sprinkle the grain, stirring during the process; leave in piles for several hours.

B. Soak the seed potatoes in the liquid for about two hours.

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